UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
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KING OF PRUSSIA, PENNSYLVANIA 19406-1415

May 2, 2012

Mr. Timothy S. Rausch
Senior Vice President and Chief Nuclear Officer
PPL Susquehanna, LLC
769 Salem Blvd, NUCSB3
Berwick, PA 18603

SUBJECT: SUSQUEHANNA STEAM ELECTRIC STATION – NRC INTEGRATED INSPECTION REPORT 05000387/2012002 AND 05000388/2012002

Dear Mr. Rausch:

On March 31, 2012 the U. S. Nuclear Regulatory Commission (NRC) completed an inspection at your Susquehanna Steam Electric Station (SSES) Units 1 and 2. The enclosed integrated inspection report (IR) presents the inspection results, which were discussed on April 17, 2012, with you and other members of your staff.

This inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

This report documents three NRC-identified findings and one self-revealing finding of very low safety significance (Green). These findings were determined to involve violations of NRC requirements. Additionally, two licensee-identified violations, which were determined to be of very low safety significance, are listed in this report. However, because of their very low safety significance and because they are entered into your correction action program (CAP), the NRC is treating these findings as non-cited violations (NCVs) consistent with Section 2.3.2 of the NRC's Enforcement Policy. If you contest any NCV in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington, D.C. 20555-0001; with copies to the Regional Administrator Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Resident Inspector at the Susquehanna Steam Electric Station. In addition, if you disagree with the cross-cutting aspect of any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region I, and the NRC Resident Inspector at the SSES.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any), will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Paul G. Krohn, Chief
Reactor Projects Branch 4
Division of Reactor Projects

Docket Nos. 50-387; 50-388
License Nos. NPF-14, NPF-22

Enclosures: Inspection Report 05000387/2012002 and 05000388/2012002
w/Attachment: Supplemental Information

cc w/encl: Distribution via ListServ

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U.S NUCLEAR REGULATORY COMMISSION

REGION I

Docket No:	50-387, 50-388
License No:	NPF-14, NPF-22
Report No:	05000387/2012002 and 05000388/2012002
Licensee:	PPL Susquehanna, LLC (PPL)
Facility:	Susquehanna Steam Electric Station, Units 1 and 2
Location:	Berwick, Pennsylvania
Dates:	January 1, 2012 through March 31, 2012
Inspectors:	P. Finney, Senior Resident Inspector J. Greives, Resident Inspector T. O'Hara, Reactor Inspector R. Rolph, Health Physicist A. Bolger, Reactor Engineer
Approved By:	Paul G. Krohn, Chief Reactor Projects Branch 4 Division of Reactor Projects

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SUMMARY OF FINDINGS

IR 05000387/2012002, 05000388/2012002 01/01/2012 – 03/31/2012; Susquehanna Steam Electric Station, Units 1 and 2; Maintenance Effectiveness, Drill Evaluation, Problem Identification and Resolution.

The report covered a 3-month period of inspection by resident inspectors and announced inspections performed by regional inspectors. Inspectors identified three NCVs and one self-revealing NCV of very low safety significance (Green). The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process (SDP)." The cross-cutting aspects for the findings were determined using IMC 0310, "Components Within The Cross-Cutting Areas." Findings for which the SDP does not apply may be Green, or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process (ROP)," Revision 4, dated December 2006.

Cornerstone: Mitigating Systems

- Green. The inspectors identified a Green NCV of 10 CFR Part 50 Appendix B, Criterion V, "Instructions, Procedures, and Drawings," regarding PPL's safety-related motor operated valve (MOV) program. Specifically, the program lacked a procedure, qualification, and prescribed acceptance criteria for actuator grease analysis and PPL improperly implemented maintenance instructions for lubricating valve stems. PPL's QA organization conducted a separate investigation and entered this issue in their CAP via CRs 1545581 and 1544737.

  This finding was considered more than minor because it was similar to IMC 0612, Appendix E, examples 3.j and 3.k, in that significant programmatic deficiencies existed that could lead to worse errors if uncorrected. The lack of a procedure, repeatable acceptance criteria, qualification, and multiple cycles without stem lubrication could result in untimely actuator overhauls and ultimately MOV degraded performance. Further, the performance deficiency affected the equipment performance attribute of the Mitigating Systems cornerstone and its objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, inadequate MOV program implementation affects MOV reliability. The issue screened to Green via IMC 0609 Attachment 4 since it was not a design or qualification deficiency or loss of safety function and did not screen as potentially risk significant due to external events. The issue was determined to have a cross-cutting aspect in the area of Problem Identification and Resolution. In this case, PPL was aware of the lack of procedural guidance and qualification for MOV grease analysis as well as non-compliance with stem lubrication instructions but had not entered the concerns in its CAP. [P.1(a)] (Section 1R12)

Cornerstone: Emergency Preparedness

- Green. The inspectors identified a Green NCV of 10 CFR Part 50.54 q and 50.47(b)(4) because PPL did not have adequate instrumentation to assess and determine if an abnormal radiological effluent release was in progress such that the EAL classification process would declare an Alert accurately and in a timely manner. Specifically, the maximum range for the liquid radwaste discharge radiation monitor was inadequate to ensure the meter was onscale when the threshold value of 200 times the alarm setpoint established by the discharge permit was reached.

The finding was more than minor because it is associated with the Emergency Preparedness (EP) cornerstone attribute of Facilities and Equipment, and affected the cornerstone objective of ensuring that a licensee is capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. Specifically, the effective range for the liquid radwaste discharge monitor was insufficient to ensure a timely and accurate EAL classification could be made. Using IMC 0609, Appendix B, Section 5.4, the finding is of very low safety significance because the finding was determined to be an example of an ineffective EAL, such that an Alert would be declared in a degraded manner. This finding is related to the cross-cutting area of PI&R - CAP because PPL did not thoroughly evaluate problems such that the resolutions address the causes and extent of conditions, to include properly classifying, prioritizing and evaluating for operability. Specifically, PPL failed to appropriately evaluate the extent of condition from similar NCVs issued in November 2008 and 2010 regarding inadequate instrumentation to support EAL declarations. [P.1(c)] (Section 1EP6)

Cornerstone: Radiation Safety

- Green. A self-revealing, Green NCV of Technical Specification (TS) 5.7.1 was identified when a worker did not comply with a radiological barrier and protective measures for high radiation area (HRA) entry. Specifically, the worker entered a HRA but was not on the proper radiation work permit (RWP) and had not been briefed for HRA entrance. Upon identification, PPL conducted a Susquehanna Error Prevention Team Assessment (SEPTA), entered this issue into their CAP as Condition Report (CR) 1546827, and issued both an Effluents department clock reset and a Radiological Safety Note to station personnel.

  The finding was determined to be more than minor based on similarity to IMC 0612, Appendix E, Example 6.h, which describes an improper entry into an HRA. Specifically, the individual was not authorized entry into a HRA. It was also more than minor based on association with the human performance attribute of the Occupational Radiation Safety cornerstone and its objective to ensure the adequate protection of worker health and safety from exposure to radiation from radioactive material during routine civilian nuclear reactor operation. The finding was evaluated in accordance with IMC 0609, Appendix C, where it was determined to be Green since PPL's three year average collective dose is less than 240 person-rem/unit. The inspectors determined that this issue had a cross-cutting aspect in Human Performance - Work Practices. Human error prevention techniques, such as pre-job briefings and self-checking are expected to be used commensurate with the risk of the assigned task, such that work activities are performed safely. Personnel also do not proceed in the face of uncertainty or unexpected circumstances. In this case, the worker did not adhere to the pre-job briefings associated with the assigned RWP that prohibited HRA entry and the worker's health physics (HP) briefing that did the same. Further, the individual proceeded in the face of uncertainty by breaching the HRA boundary. [H.4(a)] (Section 4OA2.1)

- Green. The inspectors identified a Green NCV of TS 5.4.1.a, which requires that written procedures be implemented covering the activities in the applicable procedures recommended by Regulatory Guide (RG) 1.33, including procedures for RWPs. On December 5, 2011, a work crew identified that dose rates exceeded the "Alert" levels specified on their RWPs used to transfer an 1100 Curie Cesium 137 source from a shipping cask to a calibration irradiator. Procedure NDAP-QA-0626, "Radiological Controlled Area (RCA) Access and RWP System," Appendix X, provides specific actions that the radiation protection technician providing job coverage must take when "Alert" levels are exceeded.

All of the actions were not completed prior to restarting the work on December 5, 2011. Specifically, higher levels of supervision were not notified, the RWP was not changed, and no additional actions or precautions were documented in the RWP remarks log as required by NDAP-QA-0626, Appendix X. PPL subsequently entered the issue into their CAP as CR 1521467.

The finding is more than minor because it is associated with the Radiation Safety - Occupational Radiation Safety cornerstone attribute of program and process and affected the cornerstone objective of protecting worker health and safety from exposure to radiation. Specifically, PPL did not take the appropriate actions defined in the procedure to evaluate actions to prevent recurrence prior to restarting work when RWP alert levels had been exceeded. Using the IMC 0609, Appendix C, "Occupational Radiation Safety SDP," the inspector determined that the finding was of very low safety significance (Green) because it did not involve: (1) an as low as is reasonably achievable (ALARA) planning and controls deficiency, (2) an overexposure, (3) a substantial potential for overexposure, or (4) an impaired ability to assess dose. This finding was caused by inadequate procedure compliance. Consequently, the cause of this deficiency had a cross-cutting aspect in the area of Human Performance. Specifically, PPL did not follow procedures. [H.4(b)] (Section 4OA2)

Other Findings

Violations of very low safety significance or Severity Level IV, which were identified by PPL, were reviewed by the inspectors. Corrective actions taken or planned by PPL have been entered into PPL's CAP. These violations and corrective action tracking numbers are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

Unit 1 began the inspection period at 100 percent power. Unit 1 was reduced to 68, 77, 75, and 70 percent power on January 13, February 17, March 2, and March 16 respectively for control rod pattern adjustments. On March 22, Unit 1 commenced a coastdown to a scheduled refueling outage. Unit 1 was shutdown on March 31.

Unit 2 began the inspection period at 100 percent power. Unit 2 was reduced to 73 percent power for a control rod pattern adjustment on January 28. Unit 2 was reduced to 84 percent power for two days for condenser waterbox cleaning on March 17. Unit 2 was reduced to 76 percent power on March 23 for a control rod sequence exchange. Unit 2 remained at or about 100 percent power for the remainder of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R04 Equipment Alignment

.1 Partial System Walkdowns (71111.04Q – 3 samples)

a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- Unit 1, Division II residual heat removal (RHR) during Division I RHR maintenance
- Units 1 and 2, residual heat removal service water (RHRSW)
- Common, 'B' control structure (CS) chiller while 'A' out-of-service (OOS)

The inspectors selected these systems based on their risk-significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors reviewed applicable operating procedures, system diagrams, the Updated Final Safety Analysis Report (UFSAR), Technical Specifications (TSs), work orders (WOs), condition reports (CRs), and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have impacted system performance of their intended safety functions. The inspectors also performed field walkdowns of accessible portions of the systems to verify system components and support equipment were aligned correctly and were operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies. The inspectors also reviewed whether PPL staff had properly identified equipment issues and entered them into the CAP for resolution with the appropriate significance characterization.

b. Findings

No findings were identified.

1R05 Fire Protection

.1 Resident Inspector Quarterly Walkdowns (71111.05Q - 5 samples)

a. Inspection Scope

The inspectors conducted tours of the areas listed below to assess the material condition and operational status of fire protection features. The inspectors verified that PPL controlled combustible materials and ignition sources in accordance with administrative procedures. The inspectors verified that fire protection and suppression equipment was available for use as specified in the area pre-fire plan, and passive fire barriers were maintained in good material condition. The inspectors also verified that station personnel implemented compensatory measures for OOS, degraded, or inoperable fire protection equipment, as applicable, in accordance with procedures.

- Unit 1, reactor building (RB) elevation 749' (Fire Zones 1-5A-N, -S, -W, 1-5H)
- Unit 1, RB elevation 779' (Fire Zones 1-6A, 6B, 6C, 6D)
- Unit 2, RB elevation 779' (Fire Zones 2-6A, B, C)
- Unit 2, RB elevation 683' (Fire Zones 2-3B-N,- S, -W)
- Common, CS elevation 806' (Fire Zones 0-30A)

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06 - 1 sample)

.1 Internal Flooding Review

a. Inspection Scope

The inspectors reviewed documents, interviewed plant personnel, and walked down structures, systems and components (SSCs) to evaluate the adequacy of PPL's internal flood protection measures. The inspection focused on verifying that PPL's flooding mitigation plans and equipment were consistent with the design requirements and risk analysis assumptions. The material condition of credited components such as watertight plugs, floor drains, flood detection equipment, and alarms were also assessed to determine whether the components were capable of performing their intended function. The inspectors also verified that adequate procedures were in place to identify and respond to floods. Documents reviewed are listed in the Attachment. The following area was reviewed:

- Common, Unit 2 RB 683' and CS 783'

b. Findings

No findings were identified.

1R07 Heat Sink Performance (71111.07T – 3 samples)

a. Inspection Scope

Based on a plant specific risk assessment, past inspection results, and recent operational experience, the inspectors selected and completed the following heat sink and heat exchanger (HX) samples:

Heat Sink Sample (1)

The inspector conducted a walkdown of the Unit 1 and Unit 2 common spray pond structure and associated equipment. The spray pond serves as the ultimate heat sink (UHS) for both Unit 1 and Unit 2. The inspectors reviewed a recent survey of spray pond silt accumulation and recent structural inspection reports of the condition of the embankments of the spray pond and the emergency service water (ESW) pump house.

The inspectors observed the conditions outside and inside the spray pond pump house and the associated piping and pumps of the ESW system and the RHRSW system. The inspectors observed the operation of the spray manifolds located above the surface of the spray pond. The inspectors reviewed PPL's calculation which demonstrated that the spray pond had sufficient heat removal capacity to carry out the safety-related functions described in the Unit 1 and Unit 2 UFSAR.

The inspectors reviewed the original construction drawings for the spray pond and reviewed PPL's recent structural inspections of the pond overflow path and the embankments of the pond. The inspectors also reviewed the periodic surveillance procedures performed to check the chemical treatments performed on the spray pond and associated water systems to prevent degradation of the spray pond structures.

The inspectors verified that PPL conducts inspections of buried piping associated with the Unit 1 and Unit 2 spray pond and associated systems. The inspectors reviewed the operation and maintenance (O&M) records for the cathodic protection system which is used to prevent degradation of buried, safety-related piping systems at Susquehanna Unit 1 and Unit 2. Also, the inspectors reviewed the results of the American Society of Mechanical Engineers (ASME), Section XI, Subsection IWA 5244 testing completed on buried piping from the ESW system and the RHRSW system which serve the spray pond.

The inspectors reviewed recent common spray pond system health reports, and reviewed the design calculations of the pond heat removal capacity and the results of accumulated silt in the spray pond.

Unit 1 HX Sample (1)

The inspectors performed a walkdown of the accessible areas of the Unit 1 RHR HXs and system. The inspectors reviewed surveillance test records which verified the ability of the HXs to remove sufficient heat to support plant operation of and carry out the HX design function.

The inspectors reviewed PPL's calculations showing that the HX was not susceptible to water hammer damage or to flow induced vibration damage if operated within the correct fluid flow velocity ranges. The inspectors also verified that PPL conducts periodic tests

to ensure that HX flow remains within the design limits. The inspectors reviewed the HX cleaning procedures, the results of eddy current testing of the HXs and the numbers of plugged tubes in each of the HXs.

The inspectors reviewed the periodic surveillance test results which monitor the chemical environment intended to prevent corrosion of the system piping, valves, and HXs.

Unit 1 ESW HX Sample (1)

The inspectors conducted a walkdown of accessible equipment and structures of the ESW system and associated safety-related HXs and piping.

In emergency situations the ESW system can cool all of the safety-related HXs for Susquehanna Unit 1. The inspectors conducted a walkdown of the ESW safety-related HXs and pumps and the associated structural supports. The inspectors also interviewed the responsible system engineer about system operation, past piping leaks and future, planned piping repairs and upgrades. Also, the inspectors reviewed recent ESW system health reports, and reviewed recent system heat removal capacity test reports.

The inspectors verified, through review of design records, that the safety-related HXs for Unit 1 have been designed to minimize the potential for water hammer and that operational flow values have been chosen to minimize the potential for flow induced vibration effects from occurring in the HXs served by the system. Additionally, there are no tubes plugged in the safety-related systems served by the ESW system.

The inspectors reviewed PPL's test and inspection, maintenance, chemical control, and performance monitoring methods for the ESW system, to determine whether potential deficiencies could mask degraded performance, and to assess the capability of the systems to perform their design functions. In addition, the inspectors evaluated whether any potential common cause heat sink performance problems could affect multiple HXs or heat removal paths in mitigating systems or could result in an initiating event.

Review of Corrective Action Reports

The inspectors selected and reviewed a sample of CAP reports related to the common spray pond, the Unit 1 RHR HXs, the Unit 1 ESW system, and leaks in above ground and buried piping systems. The review verified that PPL was appropriately identifying, characterizing, and correcting problems related to these systems and components, and that the planned or completed corrective actions for the reported issues were appropriate. The reports reviewed are listed in Attachment 1.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program

.1 Resident Inspector Quarterly Review (71111.11Q – 2 samples)

a. Inspection Scope

The inspectors observed licensed operator simulator training. The inspectors evaluated operator performance during the simulated event and verified completion of risk significant operator actions, including the use of abnormal and emergency operating procedures (EOPs). The inspectors assessed the clarity and effectiveness of communications, implementation of actions in response to alarms and degrading plant conditions, and the oversight and direction provided by the control room supervisor. The inspectors verified the accuracy and timeliness of the TS action statements entered by the shift technical advisor. Additionally, the inspectors assessed the ability of the crew and training staff to identify and document crew performance problems. The following scenario was reviewed:

- Common, job performance measures (JPMs) and feedwater (FW)/integrated control system (FW/ICS) malfunctions

In addition, on January 13, 2012, the inspectors observed the control room operators perform a control rod sequence exchange. The inspectors observed the pre-evolution brief and reviewed the post-evolution critique to ensure that the crew was ready to perform the evolution and were self-critical in their appraisal of their performance. Additionally, the inspectors observed the crew during the evolution to verify that procedure use, crew communications, and coordination of activities in the control room met established expectations and standards.

- Unit 1, control rod sequence exchange on January 13, 2012

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12 – 1 sample)

a. Inspection Scope

The inspectors evaluated PPL's work practices and followup corrective actions for selected SSCs issues to assess the effectiveness of PPL's maintenance activities. The inspectors reviewed the performance history of those SSCs and assessed PPL's extent of condition determinations for those issues with potential common cause or generic implications to evaluate the adequacy of PPL's corrective actions. The inspectors reviewed PPL's problem identification and resolution (PI&R) actions for these issues to evaluate whether PPL had appropriately monitored, evaluated, and dispositioned the issues in accordance with PPL procedures and the requirements of 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance." In addition, the inspectors reviewed selected SSC classification, performance criteria and goals, and PPL's corrective actions that were taken or planned, to determine whether the actions were reasonable and appropriate. Documents reviewed are listed in the Attachment. The following system was reviewed:

- Unit 2, RHR minimum flow valve 7B

b. Findings

Introduction. The inspectors identified a Green NCV of 10 CFR Part 50 Appendix B,

Criterion V, “Instructions, Procedures, and Drawings”, regarding PPL’s safety-related motor operated valve (MOV) program. Specifically, the program lacked a procedure, qualification, and prescribed acceptance criteria for actuator grease analysis and PPL improperly implemented maintenance instructions for lubricating valve stems.

Description. On February 1, 2012, the Division II RHR minimum flow valve tripped its thermal overloads and failed to stroke open during suppression pool cooling. As a result of this failure, the inspectors reviewed the valve’s maintenance history and, by relation, PPL’s MOV program. The inspectors noted a number of examples regarding inadequate MOV program implementation, specifically:

- PPL did not have a procedure for qualitative MOV grease analysis. Analysis was conducted by the MOV engineer using two sheets. One was a color facsimile of an MOV Long Life Grease Evaluation Guide from the vendor and the other was an uncontrolled sheet with a list of color and texture categories. The vendor sheet had a table of five color categories, five texture categories, and associated contaminant and action columns. The uncontrolled sheet had four color categories and six texture categories. The number of categories between the two sheets did not equate and an actual standard set was not being used despite being available from the vendor. Additionally, the vendor guide had a comment at the bottom that stated, in part, that the table “should be collaborated in specific applications with more complete grease testing.”

- There was a general lack of documentation of grease analyses associated with the grease sample work orders. There were no engineering work requests generated to document grease sample analyses conducted on Generic Letter (GL) 89-10 MOVs in the drywell in the 2010 and 2011 refuel outages respectively. Additionally, the evaluations that were performed were not archived with the WOs that drew the grease samples. Instead, the results were captured in the MOV engineer’s database. This was contrary to the corrective action taken in CRA 936220 that was to start with the Unit 1 refueling outage in 2008.

- The current MOV engineer and predecessor did not possess a qualification for grease analysis. A grease evaluator qualification card, EG982, was being prepared at the time of this inspection under AR 1229974. The inspectors noted that despite the qualification being part of the QA program, the AR was being processed outside of CAP, had its due date extended eight times, was overdue in November 2011, and had exceeded two years since identification of the need for the qualification.

- Recent work orders (WOs) for GL 89-10 MOVs for Unit 1 and Unit 2 were reviewed. All of the WOs included steps to “lubricate the stem threads from above and below the actuator” and “identify valves with stems which are not accessible, initiate a WO and notify the MOV engineer.” Unit 1 WO 892550 in 2009 listed 17 valves where stem greasing was “N/A” and one valve where only the stem top was lubricated. CR 1155749 was written for five of the valves where stem greasing could not be accomplished due to valve position. Unit 1 WO 1225740 in 2011 listed 21 valves where stem greasing was “N/A” and eight valves where no stem greasing occurred due to no threads accessible. Unit 2 WO 831485 in 2007 listed six valves where stem greasing was “N/A”. Unit 2 WO 927596 in 2009 listed 27 valves where stem greasing was “not able” and eight as

"N/A." Unit 2 WO 1261872 in March 2012 listed seven valves where stem greasing was N/A and ten valves where no threads were accessible. The six valves that were listed as N/A in 2007 were also N/A'd in 2009 and 2012. For all packages reviewed, future WOs to lubricate the stems of valves not accounted for via a CR, diagnostic test, or rebuild could not be located despite work instruction directions.

- In response to the Division II RHR minimum flow valve failure to stroke open, PPL cleaned and lubricated the stem. The valve was subsequently stroked open and closed, both locally and from the control room without issue. An actuator overhaul and electrical troubleshooting were then performed without identifying any other failures indicating inadequate stem lubrication as the cause of the February 1, 2012 failure.

PPL's safety-related MOV program, as implemented by NDAP-QA-0017, "Motor Operated Valve Program," Revision 12, bases its actuator overhauls on inspection of gearbox grease once per cycle. This is referred to as an "on-demand," or condition-driven, frequency vice an established periodicity. While grease analysis may be considered a conservative, condition-based monitoring technique, this approach places additional emphasis and importance on the qualitative analysis itself. The inspectors concluded that the lack of procedural guidance, qualification, and established acceptance criteria for grease analysis was reflective of inadequate implementation of the MOV program.

Stem lubrication is also performed at the time of the grease sample and is completed once per cycle. With respect to valve stem lubrication, PPL revised all GL 89-10 valve two-year PMs to lubricate the stem from above and below the actuator as a corrective action from RHR valve failures in 2006 due to stem nut wear. One causal factor from the 2006 root cause analysis was that lubrication of the stem and stem nuts had not been performed in an optimal manner. These events resulted in the NRC's Information Notice (IN) 2006-29. Despite PPL's ascertain that lubricating any part of the stem or at least the stem nut was acceptable, the corrective action in CRA 786456 stated that the comprehensive lubrication would result in a "marked long term decrease in stem nut wear, AND improvement in actuator efficiency." The inspectors noted that the Division II RHR minimum flow valve cannot be lubricated above and below its stem when in its normally open position. Given the guidance from CRA 786456 on lubricating the stem above and below as well as the effect that lubricating the stem had on the RHR valve after its February 2012 failure, the inspectors considered that the stem lubrication aspect of the MOV program was not being adequately implemented.

The NRC has published multiple generic communications on MOV health. GL 89-10 acknowledged that stroke time testing alone is insufficient to assure MOV operability under design-basis conditions and that it involves many factors including a strong maintenance program. It added that "surveillance, adjustment, maintenance, and repair of safety-related MOVs should be performed in accordance with quality assurance program methods that meet the requirements of 10 CFR Part 50." IN 2010-03 concluded that "it is important to assess lubricant performance in MOV applications as it relates to PM intervals, PM practices…" The inspectors determined that not prescribing or accomplishing MOV grease analysis by procedure, qualification, or appropriate acceptance criteria to assure evaluation consistency, and not properly implementing

maintenance instructions for valve stem lubrication was a performance deficiency. PPL's QA organization conducted a separate investigation and entered this issue in their CAP via CRs 1545581 and 1544737.

The inspectors noted that many of the MOV program deficiencies listed above possessed a common aspect of an insufficiently low threshold for entering issues into PPL's CAP and were key factors in determining the issue's cross-cutting aspect in PI&R - CAP. Predominantly and reflective of current performance, the required WOs to ensure future valve stem lubrication were not generated as required for both units. The inspectors also noted that as part of a 2008 response to a prevent-recurrence corrective action (936220) related to the RHR stem nut replacement, there was no specific procedure for evaluation of these grease samples. Finally, the AR for processing a QA-related qualification card was being handled outside of CAP and had been extended multiple times.

Analysis. Inadequate implementation of the MOV program was a performance deficiency within PPL's ability to foresee and correct. This finding was considered more than minor because it was similar to IMC 0612, Appendix E, examples 3.j and 3.k, in that significant programmatic deficiencies existed that could lead to worse errors if uncorrected. The lack of a procedure, repeatable acceptance criteria, qualification, and multiple cycles without stem lubrication could result in untimely actuator overhauls and ultimately MOV degraded performance. Further, the performance deficiency affected the equipment performance attribute of the Mitigating Systems cornerstone and its objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, inadequate MOV program implementation affects MOV reliability. The issue screened to Green via IMC 0609 Attachment 4 since it was not a design or qualification deficiency or loss of safety function and did not screen as potentially risk significant due to external events.

The issue was determined to have a cross-cutting aspect in the area of Problem Identification and Resolution. The licensee is expected to implement its CAP with a low threshold for identifying issues and in a timely manner commensurate with safety significance. In this case, PPL was aware of the lack of procedural guidance and qualification for MOV grease analysis, as well as non-compliance with stem lubrication instructions, but had not entered the concerns in its CAP. [P.1(a)]

Enforcement. 10 CFR Part 50 Appendix B, Criterion V requires, in part, that "activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, shall be accomplished in accordance with these, and shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished." Contrary to this, PPL's MOV grease analysis was not prescribed or accomplished by procedure and did not have appropriate acceptance criteria to assure consistency in evaluation. In addition, stem lubrication was not accomplished in accordance with station work orders and instructions. Since this issue was entered into PPL's CAP as CRs 1545581 and 1544737, it is being treated as an NCV in accordance with the NRC's Enforcement Policy. **(05000387;388/2012002-01, Inadequate MOV Program Implementation)**

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 5 samples)

a. Inspection Scope

The inspectors reviewed the assessment and management of selected maintenance activities to evaluate the effectiveness of PPL's risk management for planned and emergent work. The inspectors compared the risk assessments and risk management actions (RMAs) to the requirements of 10 CFR Part 50.65(a)(4) and the recommendations of NUMARC 93-01, Section 11, "Assessment of Risk Resulting from Performance of Maintenance Activities." The inspectors evaluated the selected activities to determine whether risk assessments were performed when specified and appropriate RMAs were identified.

The inspectors reviewed scheduled and emergent work activities with licensed operators and work-coordination personnel to evaluate whether risk management action threshold levels were correctly identified. In addition, the inspectors compared the assessed risk configuration to the actual plant conditions and any in-progress evolutions or external events to evaluate whether the assessment was accurate, complete, and appropriate for the emergent work activities. The inspectors performed control room and field walkdowns to evaluate whether the compensatory measures identified by the risk assessments were appropriately performed. Documents reviewed are listed in the Attachment. The selected maintenance activities included:

- Unit 1, emergent repair of reactor protection system (RPS) voter logic module A2
- Unit 1, 1B RHRSW loss of coolant accident (LOCA) trip enable limiting condition for operation (LCO) in 6 out of 7 days
- Common, elevated risk while swapping ‘E’ emergency diesel generator (EDG) in for ‘A’ EDG
- Common, Yellow Risk during fuel moves
- Common, ‘B’ CS chiller trip on Freon leak

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 5 samples)

a. Inspection Scope

The inspectors reviewed operability determinations that were selected based on risk insights to assess the adequacy of the evaluations, the use and control of compensatory measures, and compliance with TSs. In addition, the inspectors reviewed the selected operability determinations to evaluate whether the determinations were performed in accordance with NDAP-QA-0703, "Operability Assessments." The inspectors used the TSs, Technical Requirements Manual (TRM), UFSAR, and associated Design Basis Documents as references during these reviews. Documents reviewed are listed in the Attachment. The issues reviewed included:

- Unit 1, elevated reactor core isolation cooling (RCIC) room radiological levels while cycling steam admission valve
- Unit 1, 1B drywell floor drain sump pump start delays

- Unit 2, RCIC suction transfer level switch from condensate storage tank (CST)
- Common, instrument tubing clamps
- Common, fire protection pipe shear

b. Findings

No findings were identified.

1R18 Plant Modifications

.1 Temporary Modifications (71111.18 – 1 sample)

a. Inspection Scope

The inspectors reviewed a temporary plant modification to determine whether the changes adversely affected system or support system availability, or adversely affected a function important to plant safety. The inspectors reviewed the associated system design bases, including the UFSAR, TSs, and assessed the adequacy of the safety determination screening and evaluation. The inspectors also assessed configuration control of the changes by reviewing selected drawings and procedures to verify that appropriate updates had been made. The inspectors compared the actual installation to the modification documents to determine whether the implemented change was consistent with the approved documents. The inspectors reviewed selected post-installation or removal test results as appropriate to evaluate whether the actual impact of the change or removal had been adequately demonstrated by the test. The following modification was included in the review:

- Common, bypassing control rod drive (CRD) high temperature alarms

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 5 samples)

a. Inspection Scope

The inspectors observed portions of post-maintenance test (PMT) activities in the field to determine whether the tests were performed in accordance with the approved procedures. The inspectors assessed the test adequacy by comparing the test methodology to the scope of maintenance work performed. In addition, the inspectors evaluated acceptance criteria to determine whether the test demonstrated that components satisfied the applicable design and licensing bases and TS requirements. The inspectors reviewed the recorded test data to determine whether the acceptance criteria were satisfied.

- Unit 1, Division I core spray (CS) following valve, cooler, and motor work
- Unit 1, RPS voter failure of logic module A2
- Unit 1, stroke failure of inboard suppression pool (SP) water filter pump suction isolation valve
- Common, ‘C’ EDG following fuel pump and injector replacement
- Common, ‘A’ CS chiller following Freon leak repairs

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities (71111.20 – 1 sample)

.1 Unit 1 Refuel Outage (RFO)

a. Inspection Scope

The Unit 1 RFO (1R17) was commenced on March 31, 2012. Prior to and during the shutdown, inspectors performed the activities below. The RFO remained in progress at the end of the inspection period.

- Outage Plan - reviewed the outage risk plan and work schedules for staff on both the operating unit and the shutdown unit
- Shutdown activities - monitored the shutdown, cooldown, and transfer to the shutdown cooling mode of decay heat (DH) removal

During the inspection activities, the inspectors reviewed the associated documentation to ensure that the tasks were performed safely and in accordance with plant TS requirements and operating procedures.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 7 samples)

a. Inspection Scope

The inspectors observed portions of selected surveillance test activities in the control room and in the field and reviewed test data results. The inspectors compared the test results to the established acceptance criteria and the applicable TS or TRM operability and surveillance requirements to evaluate whether the systems were capable of performing their intended safety functions.

- Unit 1, CS reactor coolant system (RCS) leak detection functional (RCS)
- Unit 1, SE-150-004, RCIC functional test at remote shutdown panel
- Unit 1, SE-149-007, 24 month RHR logic system functional test (LSFT) (Division I) – Online
- Unit 1, SO-116-B03, RHRSW flow surveillance - Division II (IST)
- Unit 2, CS quarterly flow verification (IST)
- Unit 2, SO-200-006, shiftly unidentified leakage calibration (RCS)
- Unit 2, SO-200-007, jet pump and recirculation surveillance

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (71114.06 - 1 sample)

a. Inspection Scope

The inspectors evaluated the conduct of routine PPL emergency drills to identify weaknesses and deficiencies in the classification, notification, and protective action recommendation development activities. The inspectors observed emergency response operations in the simulator, and Technical Support Center (TSC) to determine whether the event classifications, notifications, and protective action recommendations were performed in accordance with procedures. The inspectors also attended the station drill critique to compare inspector observations with those identified by PPL staff in order to evaluate PPL's critique and to verify whether the PPL staff was properly identifying weaknesses and entering them into the CAP.

- Common, Blue Team HP Drill on February 7, 2012

b. Findings

.1 Introduction. The inspectors identified a Green NCV of 10 CFR Part 50.54 q and 50.47(b)(4) because PPL did not have adequate instrumentation to assess and determine if an abnormal radiological effluent release was in progress such that the EAL classification process would declare an Alert accurately and in a timely manner. Specifically, the maximum range for the liquid radwaste discharge radiation monitor was inadequate to ensure the meter was onscale when the threshold value of 200 times the alarm setpoint established by the discharge permit was reached.

Description. Emergency Action Level RA1, an alert classification, is entered for any unplanned release of gaseous or liquid radioactivity to the environment that exceeds 200 times Technical Requirements Manual Limits for 15 minutes or longer. One of the threshold values associated with liquid effluent release requires declaration of an Alert for a "valid reading on any liquid effluent monitor that exceeds 200 times the alarm setpoint established by a current radioactivity discharge permit for 15 minutes or longer."

The liquid radwaste (LRW) discharge monitor (RITS06433) has a maximum range of 1E6 cpm. A sampling of historical release permits revealed that the alarm setpoint typically ranges between 10,000 to 13,000 cpm. This routinely puts the EAL threshold value (2.0-2.3 E6 cpm) beyond the effective range of the instrument. This would prevent PPL from declaring an Alert in a timely and accurate manner. PPL implemented compensatory measures to conservatively declare an Alert if the meter is off-scale pending the development of permanent corrective actions.

PPL has received two NCVs for inadequate instrumentation to support EAL declarations since 2008. First, in November 2008, inspectors identified a Green NCV for inadequate wind speed instrumentation (ML083190088). Specifically, the maximum range of a wind speed monitor was inadequate to ensure wind speed was on-scale when it crossed the EAL threshold. Apparent cause evaluation (ACE) 1053296 evaluated this NCV. The extent of condition review associated with this, which included a review of EAL instrumentation with "increased scrutiny," did not identify any similar deficiencies. Second, inspectors identified a Green NCV for inadequate instrumentation associated with a toxic gas EAL in November 2010 (ML103160334). This NCV was evaluated by

ACE 1324863, which was completed in November 2011. The ACE appropriately scoped the extent of condition to include all permanent and temporary instrumentation to support EAL declarations. However, the action performed to investigate the scope only included a search of the CAP for previously identified issues that were similar in nature and failed to identify any similar occurrences. Inspectors determined that this action was inadequate since it did not include a review of the EALs and necessary instrumentation to ensure a similar condition did not potentially exist.

Analysis. Failure to have adequate instrumentation to support timely and accurate declaration of an emergency in accordance with the EAL classification process was a performance deficiency, which was reasonably within PPL's ability to foresee and correct. The finding is more than minor because it is associated with the Emergency Preparedness (EP) cornerstone attribute of Facilities and Equipment, and affected the cornerstone objective of ensuring that a licensee is capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. Specifically, the effective range for the liquid radwaste discharge monitor was insufficient to ensure that a timely and accurate EAL classification could be made. Using IMC 0609, Appendix B, Section 5.4, the finding is of very low safety significance because the finding was determined to be an example of an ineffective EAL, such that an Alert would be declared in a degraded manner. This finding is related to the cross-cutting area of PI&R - CAP because PPL did not thoroughly evaluate problems such that the resolutions address the causes and extent of conditions, to include properly classifying, prioritizing and evaluating for operability. Specifically, PPL failed to appropriately evaluate the extent of condition from similar NCVs regarding inadequate instrumentation to support EAL declarations. (P.1.c)

Enforcement. 10 CFR Part 50.54(q) requires that the facility licensee follow and maintain in effect emergency plans which meet the standards in 10 CFR 50.47(b). 10 CFR 50.47(b)(4) requires, in part, that emergency response plans include a standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters. The emergency classification and action level scheme required to be used by the nuclear facility licensee, and state and local response plans, rely on information provided by facility licensees for determinations of minimum initial offsite response measures. Contrary to the above, prior to the first quarter of 2012, the maximum range for the liquid radwaste discharge radiation monitor was inadequate to ensure the meter was onscale when the threshold valve of 200 times the alarm setpoint established by the discharge permit was reached, such that the EAL classification process would declare Alert RA1 in a degraded manner. PPL implemented a compensatory measure to conservatively declare the Alert if the meter is off-scale for greater than 15 minutes pending the development of permanent corrective actions. Because this violation is of very low safety significance (Green) and PPL entered this into their CAP as CRs 1538480 and 1541932, this violation is being treated as an NCV consistent with the NRC Enforcement Policy. **(NCV 05000387 & 388/2012002-02: Inadequate Instrumentation to Implement EALs for Unplanned Radiological Effluent Release)**

.2 Introduction. An unresolved item (URI) was identified concerning installed instrumentation necessary to support EAL declaration.

Description. During a review of Operating Experience (OE) related to inadequate instrumentation to support EAL declarations, inspectors questioned whether installed instrumentation to measure RB temperatures was required to support entry into the

fission product barrier EAL. Specifically, 9 of the 21 areas that need to be considered, per PPL EALs, for "Potential Loss of RCS Barrier" and "Loss of Primary Containment Barrier" if they exceed maximum normal and maximum safe temperature limits, respectively, do not have installed temperature indication and would require operator action to measure temperature locally.

The Fission Product Barrier EAL, as presented in EP-TP-001, "Emergency Classification Levels Manual," Revision 5, includes the use of room temperatures for identification of a "Potential Loss of RCS Barrier" and "Loss of Primary Containment Barrier." Both criteria reference tables of applicable areas with the corresponding "Max Normal Reactor Building Temperature" and "Max Safe Reactor Building Temperature" limits. Exceeding the "Max Normal Reactor Building Temperature" limit indicates a potential loss of the RCS barrier and exceeding the "Max Safe Reactor Building Temperature" limit indicates a loss of the primary containment barrier.

During review of this issue, the inspectors determined that 9 of the 21 areas listed do not have installed temperature indication. This criterion is "OR'd" with the area radiation readings in excess of Maximum Normal or Safe Radiation limit for the RCS barrier or Containment barrier, respectively. However, several of the 9 areas, which do not have a temperature monitor, also do not have a corresponding area radiation monitor. For example, the CS rooms are listed on the table for temperature limits, but have no installed temperature monitor and also do not have a radiation monitor. Therefore, there would be no installed instrumentation to declare the appropriate EAL for a break that was not isolated in those rooms. This has the potential to impact declaration of all four classifications (up to and including a General Emergency). This question has been entered into PPL's CAP as CR 1541912. Initially, PPL's evaluation has determined that this is consistent with industry practice and consistent with assumptions made during transition to the NEI 99-02 scheme. Specifically, the table is taken directly from EOPs and it is recognized that not all EOP criteria have installed instrumentation.

This issue will be tracked as a URI pending further NRC review of the issue to include consultation with the Office of Nuclear Security and Incident Response (NSIR). **(URI 05000387;388/2012002-03, Installed Instrumentation Necessary for EAL Declaration)**

2. RADIATION SAFETY

Cornerstone: Occupational/Public Radiation Safety (PS)

2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01)

a. Inspection Scope

During the period February 21, 2012, through February 24, 2012, the inspectors conducted the following activities to verify that PPL properly assessed the radiological hazards in the workplace and implemented appropriate radiation monitoring and exposure controls. Implementation of these controls was reviewed against the criteria contained in Title 10 of the *Code of Federal Regulations* (10 CFR) Part 20, relevant TSs, and PPL's procedures.

The inspectors reviewed all PPL Performance Indicators (PIs) for the Occupational Exposure cornerstone for followup and the results of radiation protection program self-assessments and audits.

Radiological Hazard Assessment

The inspectors verified that there have been no operational occurrences effecting radiological controls.

The inspectors reviewed the most recent surveys of the Unit 1 and Unit 2 RHR pump rooms, Unit 1 and Unit 2 turbine building (TB) general walkways, and the Unit 1 and Unit 2 RB general walkways.

The inspectors walked down the Unit 1 and Unit 2 turbine and RB general areas to evaluate material conditions and potential radiological conditions.

Instructions to Workers

The inspectors reviewed three RWPs for entry into HRAs and verified that appropriate work control instructions were specified. The inspectors verified that appropriate electronic personal dosimeter (EPD) alarm set points were specified.

The inspectors reviewed several cases where a worker's EPD alarmed on dose rate. The workers responded appropriately and the events were included in the CAP.

Contamination and Radioactive Material Control

The inspectors verified the locations of three sources.

The inspectors verified transactions involving the receipt of two nationally tracked sources at Susquehanna were updated in the national source tracking system database. The inspectors also verified PPL's administrative data was correct in the national source tracking system.

Radiological Hazards Control and Work Coverage

There was no opportunity to observe work in HRAs with significant dose rate gradients during this inspection.

The inspectors observed the postings and physical controls for several HRAs. The very high radiation areas (VHRAs) inside the drywells are not accessible during reactor power operation.

Risk-Significant HRA and VHRA Controls

The inspectors discussed the controls and procedures for high-risk HRAs and VHRAs with the Radiation Protection Manager (RPM). The inspectors verified Susquehanna provides stricter controls for very HRA access.

The inspectors discussed the controls in place for special areas that have the potential to become a very HRA during certain plant operations with a first line HP supervisor. Diving operations in the spent fuel pool (SFP) were specifically discussed.

Problem Identification and Resolution

The inspectors reviewed CRs associated with radiation monitoring and exposure control and verified Susquehanna's problems are identified at an appropriate threshold and are properly addressed for resolution.

b. Findings

No findings were identified.

2RS2 Occupational ALARA Planning and Controls (71124.02)

a. Inspection Scope

During the period February 21, 2012 through February 24, 2012, the inspectors conducted the following activities to verify that PPL was properly implementing operational, engineering, and administrative controls to maintain personnel exposure ALARA. Implementation of these controls was reviewed against the criteria contained in 10 CFR 20, applicable industry standards, and PPL's procedures.

Radiological Work Planning

The inspectors obtained a list of the work activities ranked by estimated exposure for the upcoming refueling outage. The inspectors reviewed the ALARA work activity evaluations, exposure estimates, and exposure control requirements.

The inspectors verified Susquehanna included decreased worker efficiency from use of respirators and heat stress and included remote technologies.

Verification of Dose Estimates and Exposure Tracking Systems

The inspectors verified for the above activities that Susquehanna has established measures to track, trend, and adjust occupational dose estimates for ongoing work activities. The inspectors verified dose criteria thresholds are used to prompt additional reviews. The inspectors reviewed PPL's method for adjusting exposure estimates when unexpected changes in scope, dose rates, or emergent work are encountered.

Problem Identification and Resolution

The inspectors verified that problems associated with ALARA planning and controls are identified in PPL's CAP and properly addressed.

b. Findings

No findings were identified.

2RS3 In-Plant Airborne Radioactivity Control and Mitigation (71124.03)

a. Inspection Scope

During the period February 21, 2012 through February 24, 2012, the inspectors conducted the following activities to verify that PPL was controlling in-plant airborne concentrations consistent with ALARA. Implementation of these controls was reviewed against the criteria contained in 10 CFR 20, applicable industry standards, and PPL's procedures.

Inspection Planning

The inspectors reviewed PPL's UFSAR to identify potential airborne areas and the associated ventilation systems or airborne monitoring instrumentation.

The inspectors reviewed PPL's procedures for maintenance, inspection, and use of respiratory protection equipment.

The inspector verified there were no reported PIs.

Use of Respiratory Protection Devices

The inspectors verified the air used in self-contained breathing apparatus (SCBA) is tested and meets Grade D quality.

The inspectors observed demonstrations of an individual donning and doffing a SCBA, two individuals donning and doffing a powered air hood, and two individuals donning and doffing a negative pressure respirator.

The inspectors toured several respirator storage areas. The inspectors observed the physical condition of the equipment and reviewed inspection records. The inspectors reviewed maintenance records and verified the training records for maintenance personnel.

SCBA for Emergency Use

The inspectors observed the monthly inspection of one SCBA staged for use in the TSC. The inspectors verified PPL's capability to refill and transport bottles to and from the control room and the operations support center during emergency conditions.

The inspectors verified control room operators and shift radiation protection technicians are trained and qualified in the use of SCBAs. The inspectors also verified personnel assigned to fill bottles are trained and qualified to that task.

The inspectors verified appropriate mask sizes are available and that the control room operators on duty had no facial hair that would interfere with the sealing surface of the face seal. The inspectors verified that operators on shift that required vision correction have them readily available in the control room.

The inspectors reviewed maintenance records for the three SCBAs and verified any work performed is done by trained personnel.

Problem Identification and Resolution

The inspectors verified that problems associated with control and mitigation of in-plant airborne radioactivity are put in the CAP and properly addressed for resolution.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151 – 6 samples)

.1 Initiating Events

a. Inspection Scope

The inspectors reviewed PPL's PI data for the period of January 2011 through December 2011 to determine whether the PI data was accurate and complete. The inspectors examined selected samples of PI data, PI data summary reports, and plant records. The inspectors compared the PI data against the guidance contained in Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The following performance indicators were included in this review:

- Units 1 and 2, Unplanned Scrams per 7000 Critical Hours, IE01
- Units 1 and 2, Unplanned Power Changes per 7000 Critical Hours, IE03
- Units 1 and 2, Unplanned Scrams with Complications, IE04

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152)

.1 Routine Review of PI&R Activities

a. Inspection Scope

As specified by Inspection Procedure (IP) 71152, "PI&R," the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that PPL entered issues into the CAP at an appropriate threshold, gave adequate attention to timely corrective actions, and identified and addressed adverse trends. In order to assist with the identification of repetitive equipment failures and specific human performance issues for followup, the inspectors performed a daily screening of items entered into the CAP and periodically attended screening meetings.

b. Findings

Introduction. A self-revealing, Green NCV of TS 5.7.1 was identified when a worker did not comply with a radiological barrier and protective measures for HRA entry. Specifically, the worker entered an HRA but was not on the proper RWP and had not been briefed for HRA entrance.

Description. On March 22, 2012, an Effluents department employee was working in the Unit 1 turbine building on elevation 699' in the feedwater heater alcove area. While

attempting to gain a better view of a doorway for a future high-efficiency particulate air (HEPA) filter move, the individual leaned into a posted HRA and received an electronic dosimeter (ED) dose rate alarm at 298 mR/hr. He exited the area and reported to HP where the total dose was determined to be 1.5mR. The individual had not been briefed by HP for HRA access nor was the individual on a HRA RWP. Upon identification, PPL conducted a SEPTA, entered this issue in their CAP as CR 1546827, and issued both an Effluents department clock reset and a Radiological Safety Note to station personnel.

TS 5.7.1.b requires that activities in a HRA with dose rates less than or equal to 1.0 rem/hr at 30 centimeters from the source, shall be controlled by means of an RWP that includes specification of radiation protection equipment and measures. TS 5.7.1.e requires that for individuals not qualified in radiation procedures or escorted by such a person, entry into an HRA may only be done after dose rates in the area have been evaluated and entry personnel are knowledgeable of them. PPL's procedure NDAP-QA-0626, "RCA Access and RWP System," Revision 26, implements these requirements. Step 7.13.1 requires that access into the RCA and performance of job activities within the RCA shall be controlled by the RWP. Step 7.4.5 requires a radiological briefing from HP prior to entering the HRA that includes a discussion of the required RWP, area radiation levels, and ED dose alarm and dose rate alarm settings. The inspectors determined that this issue was a noncompliance with established radiological barriers and protective measures specified for a HRA entry.

The individual had signed on to RWP 2012-007, Activity 1, which was designated for effluents general work and had alarm settings of 20 mrem dose and 80 mrem per hour dose rate. The radiological brief received had been for another task in the RCA and did not include the job or location that ultimately resulted in the violation. In this case, the worker did not adhere to the pre-job briefings associated with the assigned RWP that prohibited HRA entry, and the worker's HP briefing that did the same. Further, the individual proceeded in the face of uncertainty by breaching the HRA boundary.

Analysis. Noncompliance with established radiological barriers and protective measures specified for HRA entry was a performance deficiency that was reasonably within PPL's ability to foresee and correct. The finding was determined to be more than minor based on similarity to IMC 0612, Appendix E, Example 6.h which describes an improper entry into an HRA. Specifically, the individual was not authorized entry into a HRA. It was also more than minor based on association with the human performance attribute of the Occupational Radiation Safety cornerstone and its objective to ensure the adequate protection of worker health and safety from exposure to radiation from radioactive material during routine civilian nuclear reactor operation. Specifically, the individual violated the RWP and briefing designated to protect the worker from overexposure. The finding was then evaluated in accordance with IMC 0609, Appendix C, "Occupational Radiation Safety SDP," where it was determined to be related to ALARA work control and exposure control and evaluated considering PPL's overall performance in this area. Since PPL's three year average collective dose is currently 78.94 person-rem for Unit 1 and 126.55 person-rem for Unit 2, and both are less than 240 person-rem/unit, the finding is Green.

The inspectors determined that this issue had a cross-cutting aspect in Human Performance - Work Practices. Human error prevention techniques, such as pre-job briefings and self-checking are expected to be used commensurate with the risk of the assigned task, such that work activities are performed safely. Personnel also do not proceed in the face of uncertainty or unexpected circumstances. In this case, the worker

did not adhere to the pre-job briefing associated with the assigned RWP that prohibited HRA entry and the worker's HP briefing that did the same. Further, the individual proceeded in the face of uncertainty by breaching the HRA boundary. [H.4(a)]

Enforcement. Regarding HRAs, TS 5.7.1 states, in part, that "access to, and activities in, each such area shall be controlled by means of a RWP or equivalent" and "entry into such areas shall be made only after dose rates in the area have been evaluated and entry personnel are knowledgeable of them." PPL procedure NDAP-QA-0626, Section 7, implements these requirements. Contrary to this, on March 22, 2012 a PPL worker accessed an HRA without the proper RWP and had not been briefed on the associated dose rates. Because this finding was of very low safety significance and entered in PPL's CAP as 1546827, this finding is being treated as an NCV consistent with the NRC Enforcement Policy. (**NCV 05000387;388/2012002-04, Noncompliance with Radiological Barrier)**

.2 Failure to Follow Radiation Protection Procedures (1 Annual sample)

a. Inspection Scope

The inspectors reviewed Susquehanna activities and corrective actions associated with the December 5, 2011, transfer of an 1100 Curie Cesium source from a shipping cask to a calibration irradiator and the subsequent ED dose rate alarms (CR 1501308). The inspectors reviewed procedures applicable to work in a radiation area including: RCA access and RWP system, ALARA program and policy, and control of sealed sources. The inspectors also reviewed the root cause analysis (RCA) and the status of action items. The inspectors interviewed radiation protection personnel and the team lead for the RCA of the event.

b. Findings

Introduction. The inspectors identified a Green NCV of T.S. 5.4.1.a involving PPL's failure to implement a radiation protection procedure when RWP alert levels were exceeded. Specifically, higher levels of supervision were not notified, the RWP was not changed, and no additional actions or precautions were documented in the RWP remarks log as required by NDAP-QA-0626, Appendix X.

Description. On December 5, 2011, a work group, consisting of a shipping cask contractor, HP foreman, two HP technicians and an effluents technician, attempted to transfer an 1100 Curie Cesium 137 source from a shipping cask into an HD G10-BX-3 HP survey instrument calibrator in a warehouse outside the protected area. During the initial attempt to lower the source from the transfer shield into the calibrator, the shield door (plug) in the bottom of the transfer shield could not be withdrawn the prescribed two inches. The contractor directed the effluents technician to use additional tooling in order to provide additional, manual pressure to withdraw the shield plug. During this subsequent attempt, the shield plug was withdrawn about five inches (three inches further than prescribed) and reduced the remaining lead shielding from the source to about one and one-half inches. The EDs worn by the contractor and the effluents technician immediately alarmed indicating unexpected high dose rates. The HP technicians directed the shield plug to be reinserted, which immediately occurred, and dose rates returned back to normal levels. It was determined that the exposure time was approximately three seconds.

The work activity was stopped and the radiological exposure status of the workers was reviewed. It was determined that the peak dose rates were 8 rem/hr and 2 rem/hr and represented doses of 6.4 mrem and 3.3 mrem for the effluents technician and contractor based on their EDs, respectively. The contractor recommended attempting the same work activity in order to put the source into a safe configuration. This was based on the transfer shield resting vertically on top of the BX-3 calibrator and the risk of the heavy load remaining in this configuration was deemed to be unsafe by the contractor. The HP foreman concurred with this recommendation and the work group resumed the source load operation. This time the shield plug was withdrawn the specified two inches and the Cs-137 source was lowered into the BX-3 calibrator without further incident. After the source load operation was successfully completed, PPL management was informed. Procedure NDAP-QA-0626, "RCA Access and RWP System," Revision 26, Step 7.1.8, requires the actions of its Appendix X be completed by the HP technician providing job coverage when alert levels have been reached or exceeded. Higher levels of supervision were not notified, the RWP was not changed, and no additional actions or precautions were documented in the RWP remarks log as required by Appendix X. Consequently, the required actions were not completed prior to restarting work and measures to prevent reoccurrence were not fully implemented.

Analysis. The failure to complete the actions of NDAP-QA-0626, Appendix X, was a performance deficiency within PPL's ability to foresee and correct. Specifically, procedure NDAP-QA-0626, Step 7.1.8, requires the radiation protection technician providing job coverage to complete actions prior to restarting work. This issue is not subject to traditional enforcement since it did not have actual safety consequence, was not an issue that had the potential to impact NRC's ability to perform its regulatory function, and there were no willful aspects.

Since the issue occurred outside of the protected area, the inspectors considered the potential effect on the Public Radiation Safety cornerstone. However, the affected and nearby persons were all radiation workers. Therefore, this finding involves the Occupational Radiation Safety cornerstone and is more than minor because it affected the human performance attribute of the cornerstone and its objective of protecting worker health and safety from exposure to radiation. Specifically, PPL did not complete the actions listed in NDAP-QA-0626, Appendix X, prior to restarting work and the activity could have resulted in higher worker exposures had the drawer been completely removed during either of the two evolutions. Furthermore, higher level supervision was not immediately notified and was thereby prevented the opportunity to provide additional resources and controls.

Using the Occupational Radiation Safety SDP, the inspectors determined that the finding screened as very low safety significance (Green) because it did not involve: (1) an ALARA planning and controls deficiency, (2) an actual overexposure, (3) a substantial potential for overexposure (exposure time was limited to approximately three seconds), or (4) an impaired ability to assess dose. This finding was caused by personnel not complying with procedure requirements. Consequently, the cause of this finding had a cross-cutting aspect in the area of Human Performance – Work Practices. Specifically, PPL staff did not follow procedures. (H.4(b))

Enforcement. TS 5.4.1.a. requires that PPL establish, implement, and maintain procedures specified in RG 1.33, Revision 2, Appendix A. RG 1.33, section 7.(e) requires that procedures for RWPs shall be established and implemented. Procedure NDAP-QA-0626, step 7.1.8, requires the HP technician providing job coverage to

complete the actions in Appendix X for an RWP alert prior to restarting work. Contrary to this, on December 5, 2011, NDAP-QA-0626, Appendix X, required actions were not immediately completed following exceeded alert levels during an evolution governed, in part, by an RWP. Because this finding is of very low safety significance and has been entered into PPL's CAP as CR-1521467, this violation is being treated as an NCV consistent with NRC Enforcement Policy. (**NCV 05000387; 388/2012002-05, Failure to Follow Radiation Protection Procedures)**

4OA3 Event Followup (71153 – 1 sample)

.1 (Closed) Licensee Event Report (LER) 05000388/2011-004: Unit 2 HPCI Inoperability

a. Inspection Scope

On October 6, 2011, PPL declared the Unit 2 high pressure coolant injection (HPCI) system inoperable when early indications of potential governor failure developed. These indications were discovered by a system engineer who noticed that the output signal of the electronic governor module (EG-M), had been fluctuating over the past three days while HPCI was in standby. PPL linked the direct cause to a build-up of resistance across the overspeed test controller. PPL attributed the increase in resistance to an error in the classification of this component as run to failure, which did not allow for preventive maintenance or periodic replacement. The LER and associated RCA were reviewed for accuracy, the appropriateness of corrective actions, violations of requirements, and generic issues. This LER is closed.

b. Findings

The inspectors documented a licensee-identified violation of TS 5.4.1, "Procedures," that is discussed further in section 4OA7.

.2 (Closed) Unresolved Item (URI) 05000387; 388/2011005-06: Loss of Shied Control During Source Load

a. Inspection Scope

On December 5, 2011, PPL received an 1100 curie Cs-137 sealed source and conducted a source transfer into a Hopewell Designs (HD) BX-3 HP survey instrument calibrator. During the initial attempt to lower the source from the transfer shield into the calibrator, the shield door (plug) in the bottom of the transfer shield could not be withdrawn the prescribed 2 inches in order to lower the source down into the calibrator. A contractor directed an effluents technician to use additional tooling in order to provide additional manual pressure to withdraw the shield plug. During this subsequent attempt, the shield plug was withdrawn about five inches (three inches further than prescribed) reducing the remaining lead shielding from the source, to about one and one-half inches. The electronic dosimeters worn by the contractor and the effluents technician immediately alarmed indicating unexpected high dose rates, and the health physics technicians directed the shield plug to be reinserted, which immediately occurred, returning the dose rates back to normal. It was determined that the exposure time was approximately three seconds.

An URI was opened in inspection report 05000387; 388/2011005 pending further inspection and review of PPL's completed root cause analysis (RCA). Inspectors

reviewed the circumstances surrounding this event and PPL's associated RCA for violations of requirements and the appropriateness of corrective actions.

In addition to the inspection conducted by DRP/DRS inspectors discussed above, the Division of Nuclear Material Safety conducted an inspection of Hopewell Designs, the material licensee involved in this event. This inspection will be documented in NRC IR 15000010/2011001 for Hopewell Designs (State of Georgia Licensee GA-1434-1). This report is expected to be issued and made publically available by the end of May 2012. This URI is closed.

b. Findings

The inspectors documented a Green, NCV of TS 5.4.1.a for failure to take the required actions in NDAP QA-0626, Appendix X when the alert levels of the associated RWP were exceeded. The NCV is discussed further in section 4OA2.2.

4OA5 Other Activities

. 1 Review of INPO Evaluation

a. Inspection Scope

In accordance with IP 71111, the inspectors reviewed the October 2011 INPO evaluation interim report to determine if the results identified safety or training issues not previously identified by NRC evaluations. No additional followup is planned.

4OA6 Meetings, Including Exit

On January 19, 2012, the inspectors presented inspection results to Mr. J. Helsel, Plant Manager and other members of his staff. PPL acknowledged the findings. No proprietary information is contained in this report.

On February 24, 2012, at 1:00 p.m., the inspectors presented the inspection results to Mr. Jeffery Helsel, Plant Manager, and other members of the staff. No proprietary information is contained in this report.

On April 11, 2012, the inspectors presented the inspection results to Mr. E. Webb, Supervising Engineer – Site Design Engineering, and members of his staff. No proprietary information is contained in this report.

On April 17, 2012, the inspectors presented the inspection results to Mr. T. Rausch, Chief Nuclear Officer (CNO) and other members of the PPL staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

4OA7 Licensee-Identified Violations

The following violations of very low safety significance (Green) were identified by PPL and are violations of NRC requirements which meet the criteria of the NRC Enforcement Policy for being dispositioned as an NCV.

- On November 30, 2011, PPL identified an NCV of TS license condition 2.C.(6) when transient combustibles had been stored in a restricted area (red zone) in the Unit 1 RB. License condition 2.C.(6) requires that PPL "shall implement and maintain in effect all provisions of the approved fire protection program as described in the Fire Protection Review Report (FPRR)." FPRR section 1.4 requires that plant procedures control the use and storage of transient combustible materials. This control is implemented, in part, via NDAP-QA-0440, "Control of Transient Combustibles/ Hazardous Materials," Revision 10. Regarding restricted areas, Step 6.2.4.a states, in part, that "transient combustibles or hazardous materials shall not be stored in these areas without specific instruction to do so on the permit." The issue was more than minor in that it was similar to IMC 0612, Appendix E, Example 4.k, since the identified combustibles were in a combustible free zone required for separation of redundant trains. The finding was evaluated in accordance with IMC 0609, Appendix F and assigned a low degradation rating in accordance with its associated Attachment 2. Therefore, the initial qualitative screening determined the issue was Green. The issue was captured in PPL's CAP as CR 1498823.

- On October 6, 2011, PPL declared the Unit 2 HPCI inoperable when trending revealed that the system's EG-M output was erratic, and believed this to be an early indication of the potential governor failure. PPL determined that the direct cause was a buildup of resistance on the HPCI overspeed test controller which led to the output fluctuations. PPL's RCA determined that this was caused by a lack of preventive maintenance or replacement of the overspeed test controller. Maintenance had not been performed on the controller because it had been incorrectly classified as a criticality Code 6 component, a run to failure component, but should have been classified as a criticality Code 1 component, one requiring preventive maintenance (PM). This issue was determined to be a violation of TS 5.4.1, "Procedures," which requires that written procedures be established, implemented and maintained as recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978. RG 1.33, Appendix A 9.b, requires the development of PM schedules to specify inspection or replacement of parts that have a specific lifetime. PPL's procedure NDAP-QA-0524, Revision 14, "Equipment Reliability and Station Health Process" states that accurate determination of component criticality is necessary to ensure that all equipment meets required levels of performance. Contrary to the above, PPL did not establish preventive maintenance procedures for the overspeed test controller because they had also failed to accurately determine the component's criticality code. This performance deficiency is more than minor because the finding was associated with the Mitigating Systems cornerstone attribute of equipment performance, and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that responded to initiating events to prevent undesirable consequences. The inspectors evaluated the finding using IMC 0609, Attachment 4, "Initial Screening and Characterization of Findings," and determined the finding was Green since it was not a design or qualification deficiency and did not result in a loss of system safety function. The issue was entered into PPL's CAP as CR 1474781.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel
J. Boyer, Engineer
E. Campbell, General Planner - Maintenance
L. Casella, Cathodic Protection System Engineer
F. Curry, Senior Technology Specialist
L. Fuller, Senior Engineer
F. Gruscavage, Supervisor Programs and Components
F. Habib, Senior Engineer
R. Hollands, Senior Engineer
K. Kaleta, Instrument and Control (I&C) Technician, Level 1
R. Kessler, Radiation Operations Supervisor
A. Kuklis, ESW System Engineer
R. Rodriguez-Gillroy, Radiation Operations Supervisor
J. Kostyal, Unit Coordinator
R. Linden, PPL NDE Level 3
C. Magnes, Senior Licensing Engineer
D. Mitchell, Buried Piping Program Manager
M. Murphy, Supervising Engineer
S. Peterkin, RPM
R. Rodriguez-Gillroy, Radiation Operations Supervisor
D. Rosler, I&C Technician, Level 2
T. Strong, Supervisor FPMG-FC
R. Triano, Reactor Operator
E. Webb, Supervising Engineer
C. Young, ANII

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000387; 388/2012002-03	URI	Installed Instrumentation Necessary for EAL Declaration (1EP6.2)

Opened/Closed

05000387; 388/2012002-01	NCV	Inadequate MOV Program Implementation (1R12)
05000387;388/2012002-02	NCV	Inadequate Instrumentation to Implement EALs for Unplanned Radiological Effluent Release (1EP6.1)
05000387;388/2012002-04	NCV	Noncompliance with Radiological Barrier (4OA2.1)

05000387;388/2012002-05	NCV	Failure to Follow Radiation Protection Procedures (4OA2.2)

Closed

05000388/2011004-00	LER	Unit 2 HPCI Inoperability (40A3.1)
05000387;388/2011005-06	URI	Loss of Shield Control During Source Load (Section 4OA3.2)

LIST OF DOCUMENTS REVIEWED

(Not Referenced in the Report)

Section 1R04: Equipment Alignment

Procedures:
OP-030-002, "CS Heating, Ventilation and Air-Conditioning (HVAC)," Revision 27
OP-030-001, "CS Chilled Water System," Revision 34
ON-135-001, Loss of FPC/Coolant Inventory, Revision 33
CL-149-0014, Unit 1 RHR System Division 2, Revision 15
CL-149-0015, Unit 1 RHR System Division 2, Revision 22

Condition Reports (* NRC identified):
1520709, 1529688, 1529683, 1541930*, 1541927*

Drawings:
M-178, Sheet 1, Control Structure Air Flow, Revision 34
M-178, Sheet 2, Control Structure Air Flow, Revision 11
M-151, Sheet 1, RHR, Revision 65
M-112, Sheet 1, "Piping and Instrument Diagram (P&ID) RHRSW," Revision 50

Miscellaneous:
TM-OP-030-ST, "CS HVAC," Revision 6

Section 1R05: Fire Protection

Procedures:
FP-213-260, Access Area (11-604) Sample Room (11-620) Adjacent Areas (11-606, 619, 621) Fire Zone 2-6A, Elevation 779'-1", Revision 5
FP-213-261, Load Center Room (11-608) Fire Zone 2-6B, Elevation 779'-1", Revision 5
FP-213-262, Electrical Equipment Room (11-610) Fire Zone 2-6C, Elevation 779'-1", Revision 6
FP-113-119, Circulation Space (1-500) and Adjacent Rooms (1-511, 517, 514, 508, 513) Fire Zones 1-5A-N, S, W; 1-5H, Elevation 749'-1"
FP-213-246, Equipment Removal Area (11-200, 201) Fire Zones 2-3B – N, S, W, Elevation 683', Revision 5
FP-013-187, Standby Gas Treatment Filter Area (C-900 through C-912) Fire Zone 0-30A, Elevation 806', Revision 7
FP-113-127, "Electrical Equipment Room (1-610) Fire zone 1-6C, Elevation 779'-1"," Revision 4

FP-113-129-"H&V Supply (1-615) Fire Zone 1-6E, Elevation 779'-1"," Revision 3
FP113-126, "Load Control Room (1-608) Fire Zone 1-6B, Elevation 779'-1"," Revision 3
FP-113-125, "Access Area (1-604) Adjoining Rooms (1-621, 620, 619, 606, 601), Fire Zones 1-6A, 1-61, 0-6G, Elevation 779'-1"," Revision 5
FP-113-128, "H&V Equipment Room (1-612, 613, 614) Fire Zone 1-6D, Elevation 779'-1"," Revision 8

Condition Reports (*NRC identified):
1518075*, 1526748*, 1526419*, 1526409*, 1526246*, 1488357, 1528838, 1339127, 1468513, 1528942*, 1543870*

Drawings:
C-1725, Sheet 1, "Unit 1 RB Fire Zone Plan Elevation 779'-1"," Revision 9
C-1725, Sheet 2, "Unit 1 RB Fire Zone Doors and Fire Dampers, Elevation 779'-1"," Revision 6

Section 1R06: Flood Protection Measures

Procedure:
FSAR 9.2, 14.2

Action Requests:
1398404, 1386975

Work Orders:
520928, 572677

Miscellaneous:
EC-RISK-0539, Internal Flooding Analysis for Probabilistic Risk Assessment (PRA), Revision 1

Section 1R07: Heat Sink Performance

Procedures:
SE-016-311, ESW, RHRSW Loss of Offsite Power (LOOP) Flow Path Test, completed September 11 2007, Revision 3
SE-016-311, ESW, RHRSW LOOP B, Flow Path Test, completed September 12, 2007, Revision 3
SE-016-311, ESW, RHR Service Water (SW) Loop B, ASME XI Functional Pressure and Flow Path Test, completed November 20, 2003 Revision 2
NDAP-QA-0483, Underground Piping and Tanks Program, Revision 4
NSEP-QA-402, Underground Piping and Tanks Examinations, Revision 2
NSEP-QA-403, Underground Piping and Tanks Inspections, Revision 1

Condition Reports (*Written as a result of this NRC Inspection):
1324149, 1270191, 1412603 688653, 1540421*, 1541275*, 154087*, 1120660, 1270252, 1270191

Action Requests (Written as a result of this NRC Inspection):
1271991, 1337940, 1282128, 1341931, 1260443, 1111133, 1113281, 1117521, 1126827, 1138712, 1161095, 1161205, 1196417, 1198475, 1230319, 1255435, 1270191, 1291741, 1291934, 1346609, 1412588, 1412603, 1421510, 1481260, 1483967, 1484320, 1493693, 1502763, 1523133, 1525304, 1484320, 1324149, 1389173,

1140944, 1324149, 1510269, 1117594, 1346609, 1281704 1539865*, 713925, 1542680*

Work Orders:
855867, 905942, 855964, 855942, 474334

Drawings:
E-105161, “PPL SSES Units 1 and 2, Site and Yard Development Spray – Pond Earthwork Plan,” Revision 7
E-105188, “PPL SSES Units 1 and 2, Spray – Pond Plan and Details of Liner In Spray – Bank Area,” Revision 1
E-105186, Sheet 1, “SSES, Spray - Pond Earthwork Sections,” Revision 4
E-105186, Sheet 2, “SSES, Site and Yard Development Finish Grades and Yard Piping Spray Pond Area,” Revision 15
E-105187, Sheet 1, “SSES, Spray - Pond Sections and Details,” Revision 10
E-105188, Sheet 1, “SSES, Spray - Pond Plans and Details of Liner In Spray – Bank Area,” Revision 8
E106216, Sheet 1of 4, “SSES Common P&ID ESW System,” Revision 49
E106216, Sheet 2 of 4, “SSES Unit 1 P&ID ESW System ‘A’ LOOP,” Revision 52
E106216, Sheet 3 of 4, “SSES Unit 1 P&ID ESW System ‘B’ LOOP,” Revision 23
E106216, Sheet 4 of 4, “SSES Common P&ID ESW System,” Revision 3
E106217, Sheet 1 of 2, “SSES Unit 1 P&ID RHRSW System,” Revision 50
E106217, Sheet 2 of 2, “SSES Common P&ID RHRSW System,” Revision 18
E106254, Sheet 1 of 1, “SSES Unit 1 P&ID RCIC,” Revision 50
E106255, Sheet 1 of 2, “SSES Unit 1 P&ID RCIC Turbine – Pump,” Revision 33
E106255, Sheet 2 of 2, “SSES Unit 1 P&ID RCIC Turbine Lube Oil,” Revision 2
E106256, Sheet 1 of 5, “SSES Unit 1 P&ID RHR,” Revision 65
E106256, Sheet 2 of 5, “SSES Unit 1 P&ID RHR,” Revision 53
E106256, Sheet 3 of 5, “SSES Unit 1 P&ID RHR,” Revision 27
E106256, Sheet 4 of 5, “SSES Unit 1 P&ID RHR,” Revision 19
E106256, Sheet 5 of 5, “SSES Unit 1 P&ID RHR,” Revision 2;
E106257, Sheet 1 of 1, “SSES Unit 1 P&ID CS,” Revision 39
E106260, Sheet 1 of 1, “SSES Unit 1 P&ID HPCI,” Revision 56
E106261, Sheet 1 of 2, “SSES Unit 1 P&ID HPCI Turbine – Pump,” Revision 36
E106261, Sheet 2 of 2, “SSES Unit 1 HPCI Lubricating and Control Oil P&ID,” Revision 9
E162640, Sheet 1 of 2, “SSES Unit 2 P&ID ESW System ‘A’ LOOP,” Revision 45
E162640, Sheet 2 of 2, “SSES Unit 2 P&ID ESW System ‘B’ LOOP,” Revision 7
E162641, Sheet 1 of 1, “SSES Unit 2 P&ID RHRSW System,” Revision 29
E105949, Sheet 1 of 1, “SSES Unit 2 P&ID RCIS,” Revision 32
E105950, Sheet 1 of 2, “SES Unit 2 P&ID RCIC Turbine Pump,” Revision 28
E105950, Sheet 1 of 2, “SES Unit 2 P&ID RCIC Turbine Lube Oil,” Revision 2
E105951, Sheet 1 of 5, “SSES Unit 2 P&ID RHR,” Revision 57
E105951, Sheet 2 of 5, “SSES Unit 2 P&ID RHR,” Revision 57
E105951, Sheet 3 of 5, “SSES Unit 2 P&ID RHR,” Revision 57
E105951, Sheet 4 of 5, “SSES Unit 2 P&ID RHR,” Revision 16
E105951, Sheet 5 of 5, “SSES Unit 2 P&ID RHR,” Revision 1
E105952, Sheet 1 of 1, Revision 27; SSES Unit 2 P&ID CS,” Revision 27
E105955, Sheet 1 of 1, “SSES Unit 2 P&ID HPCI,” Revision 43
E105956, Sheet 1 of 2, “SSES Unit 2 P&ID HPCI Turbine – Pump,” Revision 28
E105956, Sheet 2 of 2, “SSES Unit 2 P&ID HPCI Lubricating and Control Oil P&ID,” Revision 9

Miscellaneous:

ESW System Health Report, [89] White; April 1, 2011 to June 30, 2011
RHRSW, System Health Report, [86.25] White; April 1, 2011 to June 30, 2011
1st Quarter 2011, Susquehanna BPRWCP Program (Buried Piping) Health Report
2nd Quarter 2011, Susquehanna BPRWCP Program (Buried Piping) Health Report
Unit Common, 054-ESW, 2nd Period 2011 (June 1 – August 31, 2011), White
Unit Common, 054-ESW, 3rd Period 2011 (September 1 – December 31, 2011), White
Unit 1, 116-RHRSW, 2nd Period 2011, White
Unit 1, 149-RHR, 2nd Period 2011, White
Unit 2, 216-RHRSW, 2nd Period 2011, White
Unit 2, 249-RHR, 2nd Period 2011, White
Unit 1, 116-RHRSW, 3rd Period 2011 (September 1 – December 31, 2011), White
Unit 1, 149-RHR, 3rd Period 2011 (September 1 – December 31, 2011), White
Unit 2, 216-RHRSW, 3rd Period 2011 (September 1 – December 31, 2011), White
Unit 2, 249-RHR, 3rd Period 2011 (September 1 – December 31, 2011), White
FASA Self-Assessment Report: Susquehanna GL 89-13 Program and UHS Inspection, FASA, 1138044-03
UFSAR Section 9.2.6.2.2. Spray Pond Descriptions
UFSAR Section 2.4.2.3.2. Drainage from Spray Pond Area
UFSAR Section 2.4.8.1 General Description of the Spray Pond
UFSAR Section 2.5.4.5.3. Spray Pond Excavation, Slope Protection and Liner Construction
UFSAR Section 2.5.4.6.1. Spray Pond Seepage Analysis
EC-049-1070, Evaluate RHR HX Performance at Reduced RHR Shell Side Flow in LPCI Operating Mode, Revision 0,
EC-HXPM-1026, Unit 1; Thermal Performance Test Data Evaluation and Uncertainty Analysis for 1E205B RHR HX, Revision 2
EC-STRU-2076, Structural Inspection of Spray Pond, Revision 0
EC-STRU-2031, Structural Inspection of ESW Pump House, Revision 1
Work Instruction, Unit 1, System 49, M1181-01, 2010; Clean and Inspect the RHRSW HX 1E205A
Work Instruction, Unit 1, System 16, M1181-02, 796290, 2010; Clean and Inspect the RHRSW HX 1E205B, 2004 Inspection (tube plugging record)
Eddy Current Testing Final Report for “1E205B Unit 1 RHRSW HX,” PPL SSES, Master Lee Energy Services
A Survey of Sediment on the Bottom of SSES ESW Spray Pond
A Survey of Sediment on the Bottom of SSES ESW Spray Pond
EC-HXPM-1025, (after cleaning) Thermal Performance Test Data Evaluation and Uncertainty Analysis for the ‘E’ Jacket Water Cooler (0E507E) Performance Test (After Cleaning HX Tubes), Revision 0;
EC-HXPM-1024, Thermal Performance Test Data Evaluation and Uncertainty Analysis for the ‘E’ Jacket Water Cooler (0E507E), Revision 0 Performance Test (Prior to Cleaning HX Tubes)
H1019, The Inspection Program for Pipe Corrosion and Degradation, SSES, Units 1 and 2; PPL Company, Allentown, PA; November 1, 1999, Revision 2;
H-1001, HX/Condenser Tube Cleaning at SSES, February 8, 2002, Revision 5
8856-M-208; TS For External Surface Treatment of Underground Steel Pipe for SSES Unit 1 and Unit 2, PPL
NRC Generic Letter 89-13, SW System Problems Affecting Safety-Related Equipment, July 18,1989
ASME, Section XI, Subsection IWA 5244 Testing of Buried Components

Letter from CORRPRO Companies Inc., to Mr. Raymond Detz, PPL Susquehanna SES, September,5, 2005;
Subject: ESW/RHRSW Pipes at Deep Well Ground Beds R3A and RAB

Section 1R11: Licensed Operator Requalification Program

Procedures:
NDAP-QA-0338, Reactivity Management and Controls Program, Revision 17
NDAP-QA-0300, Conduct of Operations, Revision 29
OP-AD-338, Reactivity Manipulations Standards and Communication Requirements, Revision 17
GO-100-012, Power Maneuvers, Revision 40
OPS-12, Administrative Control of Plant Operations, Revision 11
NDAP-00-0316, Station Communication Practices, Revision 15
NDAP-QA-0320, Special, Infrequent or Complex Test/Evolutions, Revision 13
ON-100-101, SCRAM Imminent, Revision 27
OP-145-005, Infrequent Manual RFP System Operations, Revision 8
GO-100-004, Plant Shutdown to Minimum Power, Revision

Condition Reports (* NRC identified):
1532112, 1504095, 1527343, 1258743, 1351400, 1290971, 1223184, 1224039, 1237926, 1237925, 1269457, 1534823*, 1535219, 1536994*,

Miscellaneous:
Reactivity Manipulation Package for Unit 1, Cycle 17, Dated January 12, 2012

Section 1R12: Maintenance Effectiveness

Condition Report:
1556845*

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Procedures:
NDAP-QA-0340, “Protected Equipment Program,” Revision 14
NDAP-QA-1902, Integrated Risk Management, Revision 7
NDAP-QA-1902, Integrated Risk Management, Revision 9
SI-250-315, Quarterly Calibration of CST Low Level Channels, Revision 12

Condition Reports:
1515994*, 1487647, 1487546, 1524742*, 1521042*, 1528527*, 1527374, 1528399, 1532298*, 571537042*, 1537040*, 1537561*, 1537022*, 1540201*, 1520709, 1326375, 1520774, 1524589, 1525461, 1525788, 1525534, 1525698, 1525559, 1525455, 1445982, 1446148, 1544151, 1546173, 1544633, 1544618, 1544162, 1327418, 1326334, 1119912, 1329401, 1333727, 1326375, 1306537, 1333727, 1334342, 1326183

Work Orders:
1536408, 1544306, 1546005, 1545934, 560590

Drawings:
M-186, Sheet 4, CS Chilled Water Chiller OK112B, Revision 6

E-150, Sheet 2, Schematic Diagram RHRSW Pump 1P506B, Revision 28
E-150, Sheet 13, Schematic Diagram RHRSW Pumps 1P506A and 1P506B, Revision 12

Miscellaneous:
PSP-26, "Online and Shutdown Nuclear RISK Assessment Program," Revision 9
Equipment-Out-of-Service (EOOS) RISK Profile for January 13 – January 16, Units 1 and 2
Protected Equipment Program Electronic Tracking Form for System 030, dated January 2, 2012
Risk Profiles (Units 1 and 2) for Week of January 23, 2012
Risk Management Action Summary Report for Work Order 1536408
Protected Equipment Tracking Form dated February 27, 2012 for System 158
Unit 1 Operator Logs, March 15, 2012
FSAR 7.3.1.1b.8.2.2.5
DBD009, ESW, RHRSW, and UHS, Revision 3
TM-OP-016-ST, RHRSW, Revision 9

Section 1R15: Operability Evaluations

Condition Reports (* NRC-identified):
1511529, 1514561, 1524358, 1524386, 1524892*, 1523723*, 1482499, 1519758, 1519833, 1533172, 1530974, 1531116, 1526156, 1516173, 1286047, 950004, 1434424, 1527123,

Work Orders:
1526171, 15172228, 1296039

Drawings:
J9-16-10, Seismic Tubing Clamp 3-Directional, Revision 14
J9-31-1, Sheet 1, Tube Clamp, Revision 0
J9-31-2, Sheet 1, Seismic tube Clamp Data, Revision 0
J9-31-4, Sheet 1, Seismic Tube Clamp 2 Way Loads Data, Revision 0
J-461, Sheet 4, LOOP Diagram Liquid Radwaste Collection, Revision 7
FF170256, Sheet 3, Flange MTD. J-Box Output, Revision 0
FF170256, Sheet 2, Modular Receiver 4 to 20 Ma Converter, Revision 0

Miscellaneous:
ANSI/ISA-67.02.01 – 1999 Nuclear Safety-Related Instrumentation Sensing Line Piping and Tubing Standard for Use in Nuclear Power Plants
R.G. 1.151, Instrument Sensing Lines, Revision 1
Specification G-21, General Specification for Design and Installation of Seismic Category 1 Instrument Tubing for SSES, Revision 8
Specification G-1006, Design and Installation of Instrument Tubing and Tubing Supports, Revisions 2 and 3
ASME Section III, Division I Subsection NF
Maintenance Rule Basis Document, System 49, RCIC
Unit 1 Operator Logs, January 31, 2012 and June 13, 2011

Section 1R18: Permanent Plant Modifications

Procedures:
NDAP-QA-1218, Temporary Changes, Revision 11
OI-055-003,CRD High Temperature Special Log
TM-OP-055B-ST, CRD Mechanisms, Revision 3

Condition Reports (* NRC identified):
1535122, 1536813*, 1531556*, 1531621*, 1531638*, 1541437*, 1539802, 1531556, 1531621, 1531621, 1451353, 1302970, 1152353, 1154293, 1536113, 1536114, 777072, 486096, 1147697, 485985, 1262933, 539884, 1091165, 1273351, 1273350, 773550

Work Order:
1536113

Miscellaneous:
NUREG/CR-5699, Aging and Service Wear of CRDMs for BWR Nuclear Plants, Volume 1, Revision 0
RTPMs C5631-01 and C7196-01
IERP 78-206
GE SIL 173 and Supplement 1
GE SIL 179 and Supplement 1

Section 1R19: Post-Maintenance Testing

Procedures:
SO-151-A02, 92 Day CS Flow Verification A LOOP, Revision 18
SE-159-400, RHR/CS/HPCI/RCIC Component Post-Maintenance "Closed System" Testing, Revision 5
SO-151-014, CS System Cold Shutdown Valve Exercising, Revision 17
SO-024-001C, "Monthly DG 'C` Operability Test," Revision 8,
SI-178-240, APRM Voter Functional Test, Revision 1
SI-178-243, Functional Test of APRM 13 Mode 1, Revision 6
SI-178-241, Functional Test of APRM 11 Mode 1, Revision 5
SI-178-242, Functional Test of APRM 12 Mode 1, Revision 7
SI-178-244, Functional Test of APRM 14 Mode 1, Revision 6
NDAP-QA-0524, Equipment Reliability and Station Health, Revision 13

Condition Reports (*NRC-identified):
1514913*, 1514114, 1514169*, 1514172*, 1514174*, 1514176*, 1514173*, 1514177*, 1514175*, 1513951, 1513548, 1514048, 1514072, 1514589, 1514418, 1508160, 1502529, 1501714, 1507471, 1504709, 1508160, 1489990, 1515111, 1516870, 1516714, 1516689, 1514063, 1514909, 1515004, 1515309, 1507471, 1511691, 1510899, 1510901, 1536943, 1537571, 1536498, 1536385, 1536759, 1532391, 1532484, 1225740, 1533178, 1534108*, 1532303, 1525534, 1532218, 1529836, 1291181, 1446514, 1448974, 1448969, 1306537, 1445982, 1446148, 1446470, 1549069*

Work Orders:
1360158, 1473841, 1434683, 1383361, 1183746, 1360635, 1342951, 1161105, 1344048, 1536408, 964990, 1529843, 1524032

Drawings:
MI-E21-35, Sheet 5, CS System, Revision 14
MI-C51-19, Sheet 60, Power Range Neutron Monitoring System APRM Channel 2
MI-C51-19, Sheet 68, RPS Output

Miscellaneous:
Operator Logs Unit 1, January 5, 2012
FIS-E21-IN006A, Instrument Calibration Sheet, Revision 7
MT-024-024, "Diesel Engine Analysis and Load Balancing," Revision 6
MT-024-007, "Emergency Diesel Fuel Injection Nozzle Removal, testing, and Installation," Revision 13
Maintenance Department Communication 2012-01, Revision 1
'C` EDG Analyzer Data from January 13, 1012 and September 21, 2011
TM-OP-0780-ST, Power Range Neutron Monitor System, Revision 7

Section 1R20: Refueling and Other Outage Activities

Procedures:
GO-100-005, Plant Shutdown to Hot/Cold Shutdown, Revision 53
OP-149-002, RHR Shutdown Cooling, Revision 46
GO-100-010, Emergency Core Cooling System (ECCS)/DH Removal in Mode 4, 5, or Defueled, Revision 19
GO-100-004, Plant Shutdown to Minimum Power, Revision 58

Condition Reports (*NRC identified):
1550477*, 1549881

Section 1R22: Surveillance Testing

Procedures:
SE-259-200,
SI-ISI-202, Quarterly Functional Test of RCS Leakage High Pressure Monitor Channels, PHS-E21-IN007 A & B (CS System Injection Valve), Revision 10
SO-251-802, "Quarterly CS Flow Verification Division II," Revision 18
SO-200-006, Shiftly Surveillance Operating Log, Revision 60
SI-269-202, Monthly Functional Test of Drywell Floor Drain Sump Level Channels LIT-26102A and B, Revision 19
SE-150-004, "RCIC Functional Test at 1C201A," Revision 2
SE-149-007, "24 Month RHR LSFT (Division I) – Online (Partial)," Revision 2
SO-116-1303, "Quarterly RHR System Flow Ventilations," Revision 6
SO-200-007, Daily Surveillance Operating Log, Revision 53

Condition Reports (* NRC identified):
1513451*, 1513048, 1514069*, 1514413*, 1519268, 1523203, 1532641*, 1192589, 1487634, 1544151, 1546963*, 1546912*, 1549068*, 1549665, 1549666, 438557, 401309

Work Orders:
1046496, 1473835, 334325, 1276228, 130457

Miscellaneous:
TRO 3.4.3
UFSAR 5.2.5
TS 3.4.2 and TSB 3.4.2
GE SIL 517, Single LOOP Operation and Supplements
GE SIL 330, Jet Pump (JP) Beam Cracks
IERP 93187, 87092, 1336333, 1452908

NUREG/CR-3052, Closeout of IE Bulletin 80-07: BWR JP Assembly Failure
IE Bulletin No. 80-07, BWR JP Assembly Failure

Section 1EP6: Drill Evaluation

Procedures:
EP-TP-001, "Emergency Action Level (EAL) Classification Levels," Revision 4
EO-000-103, "Primary Containment Control," Revision 8

Condition Reports:
1528983, 1528985, 1528989, 1528996, 1528999, 1529002, 1529011, 1529018, 1527020*, 1528977*, 1529196, 1528974, 1528976, 1529459, 1529887, 1529396

Section 2RS1: Radiological Hazard Assessment and Exposure Controls

Procedures:
HP-AL-400, RWP ALARA Reviews and Evaluations, Revision 16
HP-TP-310, Barricading, Posting and Labeling, Revision 39
HP-TP-311, Locking and Key Control, Revision 33
HP-TP-602, Free Release Surveys, Revision 30
HP-TP-720, Airborne Concentration Sampling and Evaluation, Revision 38
NDAP-QA-0627, Radioactive Contamination Control, Revision 32
NDAP-QA-1191, ALARA Program and Policy, Revision 14

Work Requests:
2012-1001, RPV (Reactor Pressure Vessel) Disassembly, Fuel Moves and General Refuel Floor Work Activities, Revision 000
2012-1002, ISI (Invessel, Dryer, Separator); CRB (Control Rod Blades), and LPRM (Low Power Radiation Monitor) Exchange, Revision 000
2012-1306, General Entry / Work in the Drywell, Revision 000
2012-1320, Scaffolding Work in the Drywell, Revision 000
2012-1372, ISI: Piping/Hangers/Erosion Corrosion outside of Bio-shield (Nozzle) Doors and N9 Nozzle (Inside Nozzle Door), Revision 000

Miscellaneous
January 31, 2012, Self Assessment, "IER L2-11-1 Inadequate Collective Radiation Exposure Performance"
January 30, 2012, Station ALARA Committee Meeting Minutes

Surveys

Description	Date	Time
Unit 1 TB 656' & 646'	January 17, 2012	2:30 Preventative Maintenance (PM)
Unit 1 TB 676'	January 17, 2012	2:00 PM
Unit 1 TB 699'	December 18, 2011	1:00 PM
Unit 1 TB 729'	November 16, 2011	3:08 PM
Unit 1 TB 762'	January 17, 2012	10:05 AM
Unit 2 TB 656' & 646'	January 28, 2012	12:10 AM
Unit 2 TB 676'	January 24, 2012	1:10 AM
Unit 2 TB 699'	December 14, 2011	10:24 AM
Unit 2 TB 729'	November 18, 2011	2:20 PM

Unit 2 TB 762'	January 23, 2012	11:00 AM
Unit 1 RB 670'	November 12, 2011	1:55 PM
Unit 1 RB 645' & 670'	January 4, 2012	9:15 AM
Unit 1 RB 645' & 670'	September 27, 2011	5:00 PM
Unit 1 RB 683'	February 9, 2012	1:30 AM
Unit 1 RB 719'	February 8, 2012	12:40 AM
Unit 1 RB 749'	December 1, 2011	10:25 AM
Unit 1 RB 779'	November 11, 2011	9:30 AM
Unit 1 RB 818'	February 10, 2012	12:00 PM
Unit 2 RB 645' & 670'	January 12, 2012	12:00 PM
Unit 2 RB 645' & 670'	January 13, 2012	11:15 AM
Unit 2 RB 670'	November 13, 2011	10:30 AM
Unit 2 RB 683'	November 18, 2011	5:56 PM
Unit 2 RB 719'	November 29, 2011	12:30 PM
Unit 2 RB 749' & 762'	December 8, 2011	8:20 AM
Unit 2 RB 779'	October 19, 2011	12:20 PM
Unit 2 RB 779'	October 3, 2011	11:00 AM
Unit 2 RB 799'	November 9, 2011	10:12 AM
Unit 2 RB 799'	December 6, 2011	3:30 PM
Unit 2 RB 799'	December 15, 2011	5:00 PM
Unit 2 RB 818'	February 9, 2012	3:10 PM

Section 4OA1: Performance Indicator Verification

Condition Reports (* NRC identified):
1258098, 1256019, 1357237, 1453671, 1407428, 1433514, 1465073, 1431000, 1437874, 1548820*

Miscellaneous:
EO-000-102, RPV Control, Revision 9
Logs for August 19, 2011 for Unit 2
NEI-99-02, Regulatory Assessment Performance Indicator Guideline, Revision 6

Section 4OA2: Identification and Resolution of Problems

Procedures:
NDAP-QA-0621, Control of Sealed Sources, Revision 6
NDAP-QA-0626, RCA Access and RWP System, Revision 26
NDAP-QA-1191, ALARA Program and Policy, Revision 13

Condition Reports (* NRC identified):
1514933*, 1517585*, 1526103*, 1532624*, 1532627*, 1532319*, 1532611*, 1532616*, 532621*, 1532632*, 1532634*, 1534723*, 1534807*, 1534132, 1532785, 1533411, 532899, 1535805*, 1535806*, 1535807*, 1539802*, 1543458*, 1541928*, 1541933 (SCCI in H.2C)

Work Orders:
2011-0004, 2011-0005

Miscellaneous:
Type B Shield R7008, December 5, 2011at 10:45

Warehouse Offload Area, December 5, 2011 at 1:45
R7008, December 5, 2011, at 1:45
Warehouse, December 7, 2011 at 11:00
Movement of Hopewell BX3, December 9, 2011 at 12:00
RCA for CR 1501308, Revision 1
NUREG-1178, Vital Equipment/Area Guidelines Study: Vital Area Committee Report

LIST OF ACRONYMS

ADAMS	Agencywide Document and Access Management System
ALARA	As Low As Is Reasonably Achievable
ANS	Alert and Notification System
APRM	Average Power Range Monitor
ASME	American Society of Mechanical Engineers
CAP	Corrective Action Program
CFR	Code of Federal Regulations
CNO	Chief Nuclear Officer
CR	Condition Report
CRB	Control Rod Blades
CRD	Control Rod Drive
CS	Control Structure
CS	Core Spray
CST	Condensate Storage Tank
DH	Decay Heat
EAL	Emergency Action Level
ECCS	Emergency Core Cooling System
ED	Electronic Dosimeter
EDG	Emergency Diesel Generator
EG-M	Electronic Governor Module
EOOS	Equipment Out-of-Service
EP	Emergency Preparedness
EPD	Electronic Personal Dosimeter
EPU	Extended Power Uprate
ESW	Emergency Service Water
FPC	Fuel Pool Cooling
FPRR	Fire Protection Review Report
FSAR	[SSES] Final Safety Analysis Report
FW	Feedwater
HD	Hopewell Designs, Incorporated
HEPA	High-Efficiency Particulate Air
HP	Health Physics
HRA	High Radiation Area
HPCI	High Pressure Coolant Injection
HRA	High Radiation Area
HVAC	Heating, Ventilation and Air-Conditioning
HX	Heat Exchanger
ICS	Integrated Control System
I&C	Instrumentation and Controls
IN	Information Notice

IMC	Inspection Manual Chapter
IP	Inspection Procedure
IR	NRC Inspection Report
ISI	Inservice Inspection
IST	Inservice Testing
JP	Jet Pump
JPM	Job Performance Measure
LCO	Limiting Condition for Operation
LER	Licensee Event Report
LOCA	Loss of Coolant Accident
LOOP	Loss of Offsite Power
LPRM	Low Power Radiation Monitor
LSFT	Logic System Functional Test
MT	Magnetic Particle Testing
NCV	Non-Cited Violation
NDAP	Nuclear Department Administrative Procedure
NDE	Non-Destructive Examination
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
OA	Other Activities
ODM	Operational Decision Making
O&M	Operation and Maintenance
OOS	Out-of-Service
PARS	Publicly Available Records
PF	Power Factor
PI	[NRC] Performance Indicator
PI&R	Problem Identification and Resolution
PIM	Plant Issues Matrix
PMT	Post-Maintenance Test
PPL	PPL Susquehanna
QA	Quality Assurance
RB	Reactor Building
RCA	Radiologically Controlled Area
RCA	Root Cause Analysis
RCIC	Reactor Core Isolation Cooling
RCS	Reactor Coolant System
RFO	Refuel Outage
RG	[NRC] Regulatory Guide
RHR	Residual Heat Removal
RHRSW	Residual Heat Removal Service Water
RMA	Risk Management Actions
ROP	Reactor Oversight Process
RPM	Radiation Protection Manager
RPS	Reactor Protection System
RPV	Reactor Pressure Vessel
RSDP	Remote Shutdown Panel
RTP	Rated Thermal Power
RWP	Radiation Work Permit
SCBA	Self-Contained Breathing Apparatus
SDP	Significance Determination Process
SE	Safety Evaluation

SEPTA	Susquehanna Error Prevention Team Assessment
SFP	Spent Fuel Pool
SP	Suppression Pool
SSC	Structures, Systems and Components
SSES	Susquehanna Steam Electric Station
SW	Service Water
TB	Turbine Building
TRM	Technical Requirements Manual
TS	Technical Specifications
TSC	Technical Support Center
UFSAR	Updated Final Safety Analysis Report
VHRA	Very High Radiation Areas
WO	Work Order